

NO.	TITLE	DATE
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WILDLIFE MANAGEMENT AND RESEARCH NOTES

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Breeding Indices of Ruffed Grouse, Spring, 2002.

5/09/2002

Abstract: Ruffed grouse breeding populations are still at their lowest levels in over 2 decades. The 2002 drumming index for 8 survey control routes was 0.10 drumming males heard per stop compared to 0.08 in 2001. Drumming indices are at 9% of levels recorded during the peak years of 1979-81. Prospects for population recovery are poor given the continual advancement of forest succession.

Federal Aid Pittman-Robertson Project/Research Job: W-26-R-33/Job 16-G-3; Work Plan # 200302

Ruffed grouse breeding population indices were estimated during the spring of 2002 along 10 roadside drumming trend routes. The annual drumming activity center count was conducted at the Maumee Grouse Study Area located on Hoosier National Forest in Jackson/Brown counties. Roadside counts ranged from 0 to 0.27 grouse heard per stop (15 stops/route) (**Table 1**). The upper range of these values has been relatively low since 1982 when a downward shift in the population cycle became evident after a high in 1979. Three routes showed an increasing trend, three routes showed a decrease, and four had no trend changes from the previous year. Only 1 bird was observed along the routes. The combined mean for the 8 control areas was 0.10 grouse heard per stop compared to 0.08 birds heard per stop in 2001 (**Table 2**). The 0.10 grouse heard per stop is an improvement over last year but not significantly different from the values recorded the last 3 years. Drumming indices for the control routes indicate grouse breeding populations have declined fairly steadily since the cyclic peak of 1979 and are only at 9% of levels recorded during the peak years of 1979-81 (**Figure 1**).

A total of 6 drumming activity centers was located on the Maumee Grouse Study Area for estimated spring breeding population density of 1.4 grouse/100 acres (**Table 3; Figure 2**). Habitat on the Grouse Study Area is fairly reflective of habitat conditions on the Pleasant Run Unit of Hoosier National Forest. While there are some periodic fluctuations in the grouse breeding population density on the study area, there is a general downward trend as more mature forest conditions prevail. Most current activity centers are associated with old forest openings that have been pioneered by early successional hardwoods.

Advanced forest succession is the primary reason for the continual decline of ruffed grouse. Ruffed grouse habitat is primarily dense, early successional stages of hardwood stands which are disappearing in the major forest tracts in Indiana and the eastern United States. Data extracted from the 1998 inventory of Indiana's forests indicates the seedling/sapling/pole timber components of the Knobs Sampling Unit has steadily declined (-52%) since 1967, being replaced by mid to late successional sawtimber. The Knobs Sampling Unit covers a major portion of southcentral Indiana and the primary range of existing ruffed grouse populations in Indiana. The proportion of seedling/sapling/pole timber components are indicative of habitat conditions not only for ruffed grouse but woodcock and a host of early successional songbirds in the eastern United States that are also undergoing significant and parallel declines.

Table 1. Numbers of ruffed grouse heard on roadside drumming counts in Indiana between 2 - 19 April, 2001.

County / Area	Total Routes	Total Stops	Cumm Grouse		Cumm Highest Total Drums	Highest Drum Count	Total No. Seen	Grouse Per 2000	1/ Heard Stop 2001	1/ Drummings Per Stop 2001	Grouse Heard Per Stop Trend Directions																
			Total Grouse Heard	Heard Count																							
			Heard	Count							86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	
* Jackson, Brown, Monroe (Hickory Ridge, USFS)	2	30	1	1	2	1	0	0.13	0.07	0.13	0.07	0	-	-	+	-	-	0	-	+	-	0	+	+	-	+	-
*Owen-Putnam	2	30	1	1	2	2	0	0.20	0.07	0.27	0.13	-	+	-	+	0	-	0	+	-	-	+	-	-	0	+	-
*Perry Co. (Oriole-St. Croix-USFS)	2	30	2	1	3	2	0	0.00	0.07	0.00	0.13	-	+	-	+	-	-	+	0	-	0	0	0	-	+	0	+
*Washington State Forest	2	30	0	0	0	0	0	0.00	0.00	0.00	0.00	0	+	-	0	+	-	0	+	-	+	-	+	0	-	0	0
**Lawrence & Orange (Lost River E, USFS)	2	30	4	2	4	2	0	0.27	0.13	0.53	0.13	NT + - + - - + + + - + 0 - - -															
Martin & Orange (Lost River W, USFS)	2	30	2	2	2	2	0	0.13	0.13	0.13	0.13	NT - - + - - + - + 0 0 0															
**Morgan-Monroe State Forest	2	30	1	1	1	1	0	0.07	0.07	0.07	0.07	NT + + 0 - - + - + - + - 0 0 0															
**Greene	2	30	3	2	8	6	0	0.20	0.13	0.33	0.40	NT + - + - + + + - - 0 + - + +															
**Orange (Little Africa, USFS)	2	30	4	2	5	3	0	0.13	0.13	0.20	0.20	NT + + - + - 0 0 0 - - 0 - + 0															
Jefferson	2	30	0	0	0	0	1	0.07	0.00	0.07	0.00	0	+	-	0	+	-	+	0	-	0	0	+	+	0	0	-

1/ Indices calculated using route with highest count. Trend direction from previous year indicated; +, -, 0 = no change, NT = no trend.

* Areas surveyed annually and used as controls to index overall population trends.

** New (1987) areas added as controls to broaden grouse range coverage.

Table 2. Drumming count indices along roads de routes in control areas, 1979-2001.

Area	Grouse heard Per Stop ^{1/2}																							
	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	
* Hickory Ridge (USFS)	1.00	1.27	1.00	0.70	0.50	0.90	1.00	1.00	0.40	0.30	0.37	0.47	0.10	0.10	0.07	0.20	0.10	0.10	0.20	0.27	0.37	0.10	0.07	
* Owen-Putnam St. Forest	1.27	0.53	0.60	0.40	0.27	0.20	0.47	0.33	0.47	0.13	0.20	0.20	0.13	0.13	0.40	0.07	0.00	0.27	0.20	0.37	0.37	0.20	0.07	
* Perry Co. (USFS)		0.20	0.60	0.20	0.33	0.33	0.20	0.13	0.20	0.07	0.21	0.13	0.17	0.13	0.13	0.07	0.07	0.07	0.07	0.10	0.10	0.10	0.07	
* Washington St. Forest	1.53	0.73	0.60	1.07	0.70	0.00	0.07	0.07	0.13	0.07	0.37	0.13	0.00	0.00	0.07	0.00	0.07	0.00	0.07	0.37	0.30	0.00	0.00	
Sub-Means	1.60	0.78	0.91	0.60	0.38	0.37	0.44	0.35	0.30	0.15	0.29	0.23	0.08	0.10	0.17	0.09	0.07	0.12	0.14	0.10	0.05	0.08	0.05	
** Lawrence & Orange (Lost River E, USFS)									0.27	0.10	0.27	0.27	0.40	0.27	0.10	0.40	0.47	0.10	0.50	0.50	0.40	0.27	0.10	
** Morgan-Monroe St. Forest			Data for new control routes incomplete for 1976-86.							0.27	0.33	0.47	0.47	0.13	0.07	0.40	0.27	0.47	0.27	0.10	0.37	0.37	0.07	0.07
** Greene									0.13	0.27	0.20	0.27	0.13	0.27	0.47	0.53	0.13	0.07	0.07	0.27	0.37	0.20	0.13	
** Orange Co. (Little Africa, USFS)									0.00	0.47	0.70	0.47	0.50	0.40	0.40	0.40	0.40	0.20	0.07	0.37	0.30	0.10	0.10	
Grand Means									1.25	0.55	0.55	0.31	0.19	0.18	0.23	0.24	0.22	0.17	0.20	0.17	0.09	0.13	0.09	

^{1/2} Indices calculated using route with highest count.^{*} Traditional control routes.^{**} New (1987) routes added as controls to broaden grouse range covered.

Figure 1

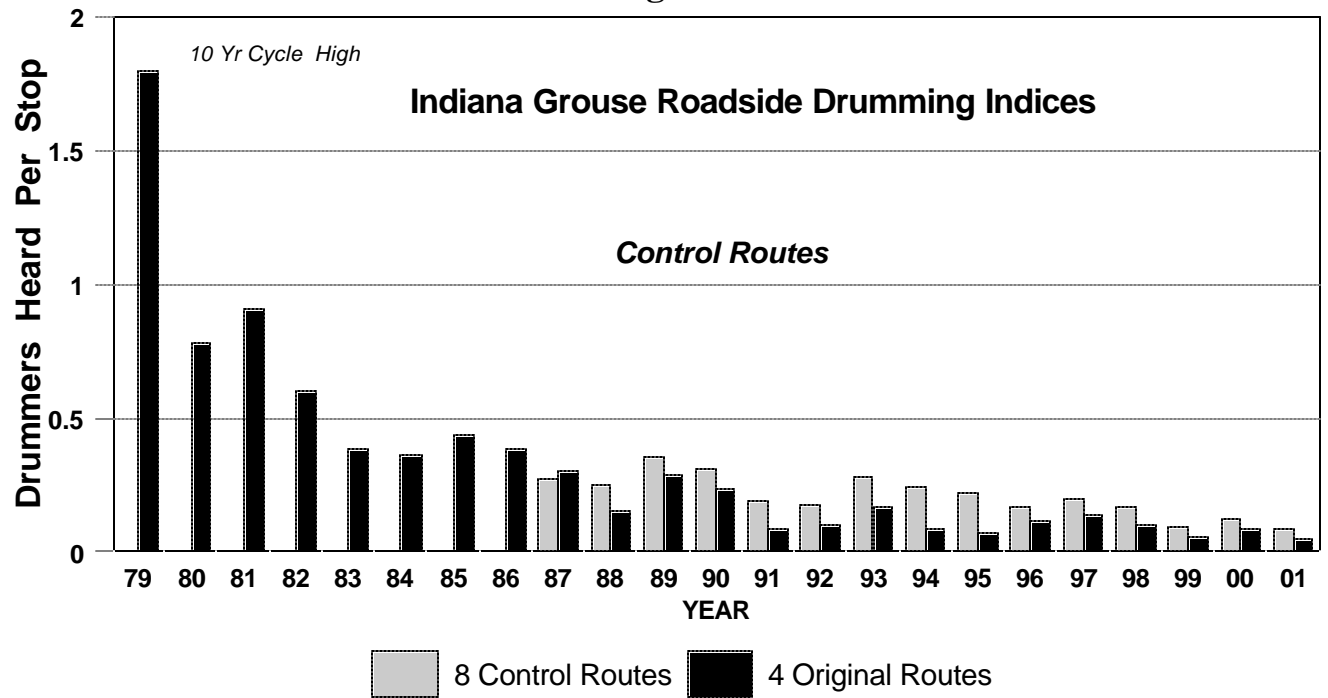
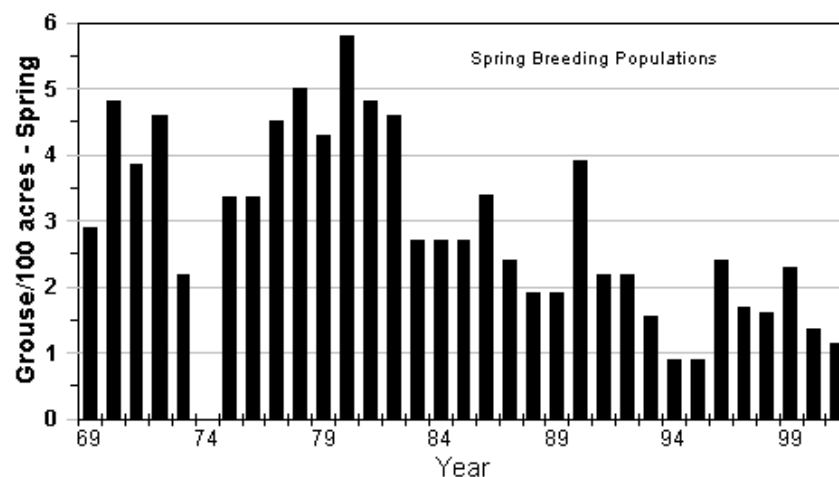


Table 3. Spring breeding densities of ruffed grouse, Maumee Grouse Study Area.		
YEAR	DRUMMING ACTIVITY CENTERS *	POPULATION DENSITY Per 40 ha (100 a) **
1969	12	2.9
1970	20	4.8
1971	16	3.9
1972	19	4.6
1973	9	2.2
1974	survey not conducted	
1975	14	3.4
1976	14	3.4
1977	18	4.5
1978	20	5.0
1979	17	4.3
1980	24	5.8
1981	20	4.8
1982	19	4.6
1983	11	2.7
1984	11	2.7
1985	11	2.7
1986	14	3.4
1987	10	2.4
1988	8	1.9
1989	8	1.9
1990	16	3.9
1991	9	2.2
1992	9	2.2
1993	7	1.6
1994	4	0.9
1995	4	0.9
1996	12	2.4
1997	8	1.7
1998	7	1.6
1999	10	2.3
2000	6	1.4
2001	5	1.1

* Area covered varied from 800 to 1,000 acres; mean area covered = 875 acres.

** Assumes a 50:50 sex ratio and represents a minimum because of non-drumming males (Gulion 1981)

Figure 2
Maumee Grouse Study Area



Forest stand size-class, Knobs Sample Unit, Indiana						
	Percent Composition			% Rate of Change		
Size-Class	1967	1986	1998	67 to 86	86 to 98	67 to 98
Seed/Sapling	8%	6%	5%	-18%	-33%	-38%
Poletimber	46%	30%	21%	-35%	-41%	-54%
Sawtimber	46%	64%	74%	38%	14%	60%
Seed/Sap/Pole						
Seed/Sap/Pole	54%	36%	26%	-33%	-28%	-52%

Table 4. Timber stand size-class distribution and trends, Knobs Unit, Indiana.

	Percent Composition			Rate of Change		
Timber Size-Class	1967*	1986*	1998**	67 to 86	86 to 98	67 to 98
Sawtimber	46%	64%	74%	38%	14%	60%
Poletimber	46%	30%	21%	-35%	-41%	-54%
Seedling/Sapling	8%	6%	5%	-18%	-33%	-38%
Seedling/Sapling/Poletimber	54%	36%	26%	-33%	-28%	-52%

** values from 1967 and 1986 inventories were transformed to format of 1998 data

** approximate values derived from preliminary data from unpublished 1998 statewide forest inventory

